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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,680	01/11/2002	Christopher E. Keefer	PU4070US2	9712

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EXAMINER

LE, DEBBIE M

ART UNIT	PAPER NUMBER
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2177

DATE MAILED: 04/29/2004

5

Please find below and/or attached an Office communication concerning this application or proceeding.

8

# Office Action Summary

Application No.

10/044,680

Applicant(s)

KEEFER ET AL.

Examiner

DEBBIE M LE

Art Unit

2177

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2002.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-51 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 11 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 9/24/04 (paper # 4) is in compliance with the provisions of 37 CFR 1.97 and has been considered by the examiner.

### ***Priority***

Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-51 are rejected under 35 U.S.C. 102(e) as being anticipated by MacCuish et al (USP 6,625,585 B1).

As per claim 1, MacCuish discloses a method for identifying correlation of data features with data responses in order to determine with features correlate to results in responses comprising:

defining a matrix (matrix) having a plurality of rows (rows) that represent the plurality of samples (molecules, x, y and z) and a plurality of columns (attributes, a, b, c, d and e) that represent the plurality of features (~~properties~~) (col. 5, lines 55-65), each row-column position of the matrix having a first binary value (binary vectors, col. 10, line 3) if the sample that is associated with the row exhibits the feature that is associated with the column (correlation appears, present, bit vector 1, col. 5, line 53) and a second binary value if the sample that is associated with the row does not exhibit the feature that is associated with the column (does not have a correlation appears, absent, bit vector is 0, col. 5, lines 53-54); and

for each column (cluster, node), recursively partitioning the column relative to remaining ones of the columns (recursively partitioning, col. 3, lines 10-56, repeats the comparison between clusters or nodes, col. 5, lines 37-38) to define a tree of conditional branches (as a tree structure, col. 10, line 45-48, determines a similarity and/or dissimilarity between the clusters, col. 13, lines 27-28) for the rows (representing molecules b and c; a; d) for each column (cluster 1; 2; 3) (col. 15, lines 56-62).

As per claim 2, MacCuish teaches wherein the recursively partitioning is followed by: analyzing the trees of conditional branches (children) for the columns to identify the conditional associations (has the same identified common) (col. 15, lines 18-20).

As per claim 3, MacCuish teaches wherein the recursively partitioning is followed by: displaying the trees of conditional branches for the columns to identify the conditional associations (output can include a graphical description, col. 10, lines 46-47).

As per claim 4, MacCuish teaches wherein the recursively partitioning comprises the following that are performed for each column:

for the column, comparing a number of occurrences of the first binary value (col. 5, lines 60-67, col. 6, lines 1-5) in both the column and in each of the remaining columns (fig. 1, # 24, every possible pair) to define a score (distance measurements, col. 23, lines 1-13) for each of the remaining columns (fig. 1, # 28, col. 15, lines 53-55, lines 63-67, col. 16, line 1);

selecting one of the remaining columns based upon the scores (fig. 5, # 62);

dividing the rows (divide the molecules (rows) into exactly two groups, col. 3, lines 27-30) that are associated with the one of the remaining columns (fig. 1, # 28, pairs share a common cluster) based on whether the first value or the second value is present in the rows (representing molecules a, b and c for cluster (column) 4), to thereby obtain two sub-matrices (subdivided group into exactly two groups, one which is best descriptor in common and other one does not containing the descriptor, col. 3, lines 29-30, 35) and two corresponding branches (nodes) of a tree (a tree structure) (col. 3, lines 38-39); and

repeatedly performing the comparing (the process then repeats the comparison between nodes, col. 5, lines 37-38), selecting and dividing for the columns of each of

the sub matrices that are associated with the two branches of the tree to obtain remaining branches of the tree (as the proximity matrix in a new row and column corresponding to the new cluster iteratively repeats the process to find the smallest entry value in the matrix, col. 24, lines 6-56) .

As per claims 5-6, MacCuish teaches wherein the selecting comprises selecting one of the remaining columns that has a maximum score and auxiliary information concerning the samples (molecule pair 1-3 has the maximum distance, col. 14, lines 45-64).

As per claim 7, MacCuish teaches wherein the repeatedly performing comprises repeatedly performing the comparing, selecting and dividing of the rows of each sub-matrix until a predefined termination is reached (as the predetermined number of times is a matter of design choice, col. 19, lines 44-62).

As per claim 8, MacCuish teaches wherein the predefined termination comprises at least one of the scores in the remaining columns being less than a predetermined score, the number of rows in a sub-matrix being less than a predetermined number and the tree having a predetermined depth (length, col. 19, lines 59-67, col. 20, lines 1-31).

As per claim 9, MacCuish teaches wherein the comparing a number of occurrences of the first binary value in both the column and in each of the remaining columns to define a score for each of the remaining columns comprises comparing a number of occurrences of the first binary value in both the column and in each of the remaining columns using at least one of a Pearson chi-square, likelihood ratio statistic and measure of agreement metric (Tversky coefficients, col. 23, lines 13-18).

As per claim 10, MacCuish teaches wherein the samples are biological samples, the features are genes, the first binary value indicates that the gene is expressed in the biological sample and the second binary value indicates that the gene is not expressed in the biological sample (as the invention is suitable for use in the field of chemistry, biology and genetics, col. 1, lines 46-48).

Claims 11, 18, 28, 35 and 45 are rejected by the same rationale as state in independent claim 1 arguments.

Claims 12, 29 and 46 have similar limitations as claim 4; therefore, it is rejected under the same subject matter.

Claims 13, 30 and 47 have similar limitations as claim 5; therefore, it is rejected under the same subject matter. Moreover, MacCuish teaches coefficient (col. 23, line 16).

Claims 14, 16-17, 31, 33-34, 48 and 50-51 have similar limitations as claim 10; therefore, they are rejected under the same subject matter.

As per claim 15, MacCuish teaches generating at least two trees (multi-domain pyramid (tree) col. 6, lines 61-62) of conditional branches for a corresponding at least two of the features (nodes A and B, col. 6, line 41), each tree of conditional branches indicating conditional associations for a corresponding feature relative to remaining ones of the plurality of features (respectively for each of nodes A-C, A-B, A, B and C, col. 6, lines 50-51).

Claims 19-27 and 36-44 have similar limitations as claims 2-10; therefore, they are rejected under the same subject matter.

Claims 32 and 49 are rejected by the same rationale as state in independent claim 15 arguments.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Steeg (USP 6,493,637 B1): Coincidence detection method, products and apparatus.

If a reference indicated as being mailed on PTO-FORM 892 has not been enclosed in this action, please contact Lisa Craney whose phone number is (703) 305-9601 for faster service.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEBBIE M LE whose telephone number is 703-308-6409. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN BREENE can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DEBBIE M LE  
Examiner  
Art Unit 2177

Debbie Le

April 22, 2004.



GRZTA ROZINSON  
PRIMARY EXAMINER